

Influence of Liquidity on Profitability: Evidence from Nepalese Banks

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Abstract

This study seeks to examine the relationship between the liquidity and the profitability of commercial Banks in Nepal. In this connection, 14 Nepalese commercial banks were selected as study samples and their financial data were gathered from the annual reports of concerned banks for the period of 2008-2017. In this study, Return on assets and net profit margin were used as indicator of profitability while liquidity ratio, investment ratio and capital ratio were used as a proxy of liquidity measures. This study used inferential statistics to explain the main features of a collection of data in quantitative terms while correlation and linear regression analysis are used for analyzing the data. Results showed that more than 49 percent bank profitability measured by return on assets and net profit margin is predicted by the liquidity variables. This empirical analysis reveals that there is insignificant positive relationship between liquidity ratio and return on assets. Similarly, there is insignificant negative relationship between investment ratio and capital ratio with return on assets. It is also found that there is insignificant positive relationship of net profit margin with liquidity ratio and investment ratio. However the net profit margin is significantly negatively related with capital ratio. Based on the results it is concluded that the liquidity measure are not statistically significant in determining the profitability of commercial banks in Nepal except the capital ratio.

Keywords: Banks, Leverage, Liquidity, Profitability.

1. Introduction

Banks are considered to be profit seeking financial firms that involve in intermediation of financial needs. They are the spreader of money in the economic segments of the country and responsible for acting as primary engines of economic growth. Banks perform the valuable function of providing liquidity on the both deficit and surplus units of the economy. They channel the financial resources from the surplus to deficit units in the highest degree of liquidity, profitability and safety. A bank handles its portfolio of asset and liability in such a way that would enhance profitability in one and liquidity and safety in the other hand. Liquidity and profitability are the two conflicting objective of a financial firm like commercial banks. If one goes up another goes down. Hence, a bank should strike a balance between these two objectives. Liquidity refers, in the context of banks, to the ability to satisfy the withdrawal orders of the depositors as well to meet other short term obligation in minimum time, cost and efforts. The management of liquidity is essential for both financial and non-financial firms to meet or to settle the obligation with immediacy. It is the way in which the

bank transforms assets in to the cash to make immediate payment. Since liquid assets such as cash and government securities generally have a relatively low return, holding them imposes an opportunity cost on a bank. In the absence of regulation, it is reasonable to expect banks will hold liquid assets to the extent they help to maximize the firm's profitability. Excess holding of such liquidity ensure safety but increases cost and therefore profitability suffers.

Profit refers to the difference between the revenue generated from the sale of out and full opportunity cost of factors used in the production of that output. It includes the premium charged for the risk taking and cost of using the owners' capital (Aburime, 2008). Banks have to earn profit to provide a fair rate of return to their shareholders as well as to grow, expand and develop their business. At the same time they satisfy the withdrawal needs of their depositors. Hence, it is important to maintain a reasonable amount of cash or cash equivalent to meet their short term obligations by balancing the profitability. Determining optimum level of liquidity is essential to ensure high profitability and safety. The existing literature shows a significant relationship between liquidity and profitability, this study is an endeavor toward further investigation and exploration of such relationship taking Nepalese data.

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1.2 Research Question

After the economic linearization in Nepal, the banking sector undergone in drastic change not only in number but also the integration with the international banking system through joint venture banks. The entry of new foreign banks and private domestic banks constitute an overall banking system of Nepal. The mismatch between assets and liabilities may create liquidity risk to a bank that exposes liquidity crises that compromise the bank performance. It might affect the overall capital and earnings adversely. Moreover, most of the banking operations heavily depend upon the deposits. If banks face the liquidity problem and depositors start withdrawing their deposits from the bank, it will create bank run and banking panic which is very disastrous for the entire economy. In this connection, the empirical literature on the determinants of banking profitability is voluminous. However there is little even not known about the issue in the developing country like Nepal. This study therefore finds the need to investigate on the effects of liquidity and financial performance of banks in Nepal through answering the research question of what is the effect of liquidity on the financial performance of commercial banks in Nepal?

1.3 Literature Review

Liquidity management is a concept that is receiving serious attention all over the world especially with the current financial situations and the state of the world economy. The importance of liquidity management as it affects corporate profitability in today's business cannot be over emphasized. The crucial part in managing working capital is required maintenance of its liquidity in day-to-day operation to ensure its smooth running and meets its obligation (Eljelly, 2004). Bourke (1989) found some evidence of a positive relationship between liquid assets and bank profitability for 90 banks in Europe, North America and Australia from 1972 to 1981, while Molyneux and Thornton (1992) and Goddard, *et al* (2004) revealed mixed evidence of a negative relationship between the liquidity variables for European banks in the late 1980s and mid-1990s, respectively. Demircug-Kunt (1998) found positive relationship between size and profitability. Similarly, Havrylchuk *et al.* (2006) finds a positive relationship between capital and profits of banks. Adebayo *et al.* (2011) studied the liquidity management and commercial banks' profitability in Nigeria and found a significant relationship between liquidity and profitability. Arif (2012) tested liquidity risk factors and assessed their impact Pakistani banks during the period (2004-2009) revealed that there is a significant impact of liquidity risk factors on the banks profitability, where an increase in deposits lead to increasing in the bank's profitability in terms of reducing dependence on the central bank in meeting the customers' obligations, and profitability is negatively affected by the allocation of non-performing

loans and liquidity gap. Lartey *et al.* (2013) conducted a study to find out the relationship between the liquidity and the profitability of banks and found that both the liquidity and the profitability were declining. Moreover, it was also found that there was a very weak positive relationship between the liquidity and the profitability of the listed banks in Ghana. Almazari (2014) investigated the internal factors that have an effect on profitability in Saudi and Jordanian banks and demonstrated a positive correlation between profitability measured by ROA of Saudi and Jordanian banks with some liquidity indicators. Pradhan *et al* (2016) examined the effect of liquidity on the performance of Nepalese commercial banks using investment ratio, liquidity ratio, capital ratio and quick ratio as the independent variables and. return on equity (ROE) and return on assets (ROA) as the dependent variable. The study found that the correlation between capital ratio and ROE is positive and it is negative for quick ratio and liquidity ratio with ROE and ROA. The empirical evidence has demonstrated that a mixed relationship between liquidity risk and financial performance of firms. This study is therefore directed towards establishing the effect of liquidity on the profitability of commercial banks in Nepal.

1.4 Hypotheses of the Study

The hypotheses for the study are formulated as follows:

H₁: There is no relationship between Liquidity ratio and return on return on assets.

H₂: There is no relationship between Investment ratio and return on assets.

H₃: There is no relationship between Capital Ratio and return on assets.

H₄: There is no relationship between Liquidity ratio and net profit margin.

H₅: There is no relationship between Investment ratio and net profit margin.

H₆: There is no relationship between Capital Ratio and net profit margin.

2. Methodology

2.1 Universe of the Study

The universe of this study will consist of all commercial bank in Nepal. There are 28 commercial banks that established and operating in Nepal. So the universe of this study is 28 commercial banks licensed by Nepal Ratsra Bank – the central bank of Nepal.

2.2 The Sample and Sampling design

Saunders, Lewis & Thornhill (2007) point out that the larger the sample size, lower the likely error ingeneralizing the population. Therefore, a sample of 14 commercial banks are selected which represent more than 50 percent of total population. The samples are

selected on the basis of purposive sampling technique. The public sector commercial banks have been removed from the sampling frame.

2.3 Data Collection Method

The study uses the secondary data of 10 years obtained from the Banks and Financial Statistics and Bank Supervision Report published by Nepal Rastra Bank from 2008 to 2017. The data collected was sorted and organized before capturing the same in Statistical Packages for Social Sciences (SPSS) for analysis. The study

used a multiple regression model using three independent variables.

2.4 Variables and Measures

This study aims to measure the relationship between the dependent and independent variables through testing the hypotheses regarding to the relationships between liquidity of banks and financial performance in the case of commercial banks in Nepal. The variables and their measurement used in the study are presented in Table 2.1.

Table 2.1 Variables used in the Study

| Category | Variables | Measurement |
|-----------------------|-------------------|---|
| Dependent Variables | Net Profit Margin | Net Income/Operating Income |
| | Return on Assets | Net Income/Total Assets |
| Independent Variables | Liquidity ratio | Liquid Assets/Deposits + Short term debts |
| | Investment Ratio | Total Credit/Deposits |
| | Capital Ratio | Equity / Total Assets |

2.5 Data Analyzing Model

The purpose of this research is to study the relationship between bank liquidity and profitability of the commercial banks therefore quantitative method is used in order to make the results successful. Secondary data is analyzed using quantitative method of linear regression using dependent and independent variables to measure the relationship of liquidity and bank profitability. Both descriptive and inferential statistics are used to summarize and to answer the research problem. The t-test is used to test the significance of the model at 5% level of significance.

The following regression models are estimated:

$$1. NPM_{it} = \beta_0 + \beta_1 LR_{it} + \beta_2 IR_{it} + \beta_3 CR_{it} + \epsilon_1 \quad (1)$$

$$2. ROA_{it} = \lambda_0 + \lambda_1 LR_{it} + \lambda_2 IR_{it} + \lambda_3 CR_{it} + e_2 \quad (2)$$

Where:

β_0, λ_0 : The intercept of equation.

β, λ : Coefficients for independent variables.

LR, IR and CR are the abbreviation of liquidity ratio, Investment Ratio and Capital Ratio – the independent variables.

NPM and ROA are the abbreviation of net profit margin and return on assets – the dependent variables

i : firm

t : time = 1, 2,.....,10 years.

ϵ and e = Error terms of model 1 and model 2.

2.6. Outliers, Multicollinearity and Autocorrelation Problem

Cook’s distance, D_i , has been used in regression analysis to find influential outliers in a set of predictor variables. A

general rule of thumb is that observations with a Cook’s Distance of more than 1 indicate an influential value or outlier. Multicollinearity problem which affect the model power and its ability in explaining the results have been checked by Variance Inflation Factor (VIF). As a rule, if VIF factors are less than 5, there is no Multicollinearity problem in the regression models (Fox, 1991). Similarly, the autocorrelation among regression model residuals have been tested using Durbin-Watson factors, if Durbin-Watson (D-W) factors are between 1 and 3 there is no autocorrelation problem (Alsaeed, 2005). The overall model fit is checked by the F- statistic. All these values are presented along with respective model summary of coefficients and are found not problematic for the models.

3. Data Analysis, Results and Discussion

3.1 Descriptive Statistics

The descriptive statistics of the dependent and independent variables used in the study are presented in Table 3.1.

Table 3.1 Descriptive Statistics

| | N | Minimum | Maximum | Mean | SD |
|-----|----|---------|---------|--------|--------|
| LR | 14 | 0.2229 | 0.4133 | 0.2700 | 0.0501 |
| IR | 14 | 0.4840 | 0.8757 | 0.7615 | 0.1030 |
| CR | 14 | 0.0246 | 0.0820 | 0.0649 | 0.0154 |
| ROA | 14 | 0.0067 | 0.0244 | 0.0148 | 0.0049 |
| NPM | 14 | 0.2692 | 1.6984 | 0.8523 | 0.3844 |

A critical examination of the descriptive statistics for the dependent and independent variables shows that the overall average return on assets (ROA) of the sample banks is 1.48 percent. ROA is considered to be a better evaluation of a bank's profitability which indicates the

efficiency of asset and liability management. The average value of 1.48 percent implies that the sample banks earned a net income of Rs 1.48 for each rupee of total assets. The standard deviation of ROA is 0.48 percent with highest of 2.44 percent and lowest of 0.67 percent. On the other hand sample banks average Net Profit Margin (NPM) is 85.2percent with the lowest value in particular year is 26.92 percent and highest of 169.84 percent. Regarding the standard deviation the value of NPM is deviate from its mean to both sides by 38.44 percent.

The liquidity ratio which is the explanatory variable of the study has an average value of 27 percent. This reveals that liquid assets represent 27 percent of total deposits and other short term debts. The highest liquidity ratio is 41.33 percent and lowest is 22.29 percent with the variation measured by the standard deviation is 5.01 percent. Similarly, average value of another liquidity measure proxied by investment ratio is 76.15 percent. It reveals that the total credit represent on average nearly 76 percent of deposits of commercial banks in Nepal. The standard deviation stands at 10.30 percent from the mean with 87.57 having the highest and 48.40 percent lowest in a particular study period. Furthermore, the average of capital ratio which is the proxy of liquidity management ratio of banks is 6.49 percent. It indicates that on average 6.49 percent of total assets of commercial banks in Nepal are financed by equity and remaining by debt capital. Higher the value of capital ratio, better the safety for the depositors because shareholder’s equity provides a buffer against adversity.

3.2 Correlation Matrix

Table 3.2 provides the Pearson correlation for the variables that we used in the regression model.

Table 3.2 Correlations Matrix

| | LR | IR | CR | ROA | NPM |
|-----|----------|---------|---------|-------|-----|
| LR | 1 | | | | |
| IR | -0.685** | 1 | | | |
| CR | -0.215 | 0.182 | 1 | | |
| ROA | 0.582* | -0.644* | -0.344 | 1 | |
| NPM | 0.163 | 0.128 | -0.605* | 0.042 | 1 |

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

From the correlation table, it is found that the bank’s profitability measured by return on assets is significantly positively correlated with the liquidity ratio but significantly negative with investment ratio. It is also negatively correlated with capital ratio but the relationship is not statistically significant. The positive

relation of ROA with liquidity ratio reveals that a higher liquid asset fetches higher profitability. This is because the liquidity ratio is calculated dividing liquid assets by deposits and other short term debt. Lower the amount of interest paying deposit and short term in comparison to non-interest earning liquid assets, higher will be the profitability. The significant negative relation of return on assets with investment ratio indicates that as the total credit to deposit increases the return on assets decreases. The possible explanation of this relationship is that since deposits cost less to bank because some deposits are non-interest bearing and if the amount such deposits decreases the bank provides loans from other means of expensive sources. As a result the investment ratio increases and the profitability measured by return on assets decreases. In the same way, the negative association between return on assets and capital ratio reveals that as the portion of equity financing increases the profitability measured by return on assets decreases. The reason for this can be attributed to the effects of leverage. The cost of equity is higher than that of cost of debt mainly because interest on debts is tax deductible. Hence, if the capital ratio increases by lowering the leverage, the return on assets of the banking firm decreases. Further, there is insignificant positive relation of net profit margin with liquidity and investment ratio but it is significantly negatively correlated with capital ratio. The results show no collinear variables because no correlation exceeds 0.8 as reported in table 3.2.

3.3 Regression Analysis

The regression coefficients of model (1) were estimated using multiple regressions analysis. Findings from the regression analysis for the selected banks are depicted in Table 3.3.

The R square measures the extent to which the explanatory variables explain the variations in the dependent variables. The R square values obtained in Table 3.3 indicate that the explanatory variables explained 49.5 percent of the variations in return on assets in the commercial banks of Nepal within the period under study. The regression coefficient reveals that there is insignificant positive relationship between liquidity ratio and return on assets. Similarly, there is insignificant negative relationship between investment ratio and capital ratio with return on assets. Regression model summary 1 tests our first three hypothesis and we fail to reject the null hypothesis concluding that there is no statistically significant relationship of return on assets with liquidity ratio, investment ratio and the capital ratio of Nepalese commercial banks.

Table 3.3 Coefficient for Predictors of Liquidity and Model Summary 1

| Model | | B | t | Sig. | VIF | Cook's Distance | | |
|-------|----------|--------|---------|--------|-------|--|-------|------|
| | | | | | | Min | Max | Mean |
| 1 | Constant | 0 .029 | 1.5788 | 0.1455 | | 0.00003 | 0.876 | 0.15 |
| | LR | 0.023 | 0.7374 | 0.4778 | 1.913 | R ² = 0.495 F= 3.268, Sig. 0.067*** D-W =1.489 | | |
| | IR | -0.021 | -1.4522 | 0.1771 | 1.887 | | | |
| | CR | -0.068 | -0.9242 | 0.3771 | 1.051 | | | |

*** Significant at the 0.10 level

** Significant at the 0.05 level

Table 3.4 Coefficient for Predictors of Liquidity and Model Summary 2

| Model | | B | t | Sig. | VIF | Cook's Distance | | |
|-------|----------|---------|--------|---------|-------|---|--------|-------|
| | | | | | | Min | Max | Mean |
| 1 | Constant | -0.310 | -0.213 | .835 | | 0.00012 | 0.3671 | 0.098 |
| | LR | 2.821 | 1.185 | 0.264 | 1.913 | R ² = 0.496 F= 3.278 Sig. 0.067*** D-W =1.929 | | |
| | IR | 1.836 | 1.596 | 0.142 | 1.887 | | | |
| | CR | -15.378 | -2.674 | 0.023** | 1.051 | | | |

*** Significant at the 0.10 level

** Significant at the 0.05 level

The R square values obtained in Table 3.4 indicate that the explanatory variables (liquidity ratio, investment ratio and capital ratio) explained 49.6 percent of the variations in net profit margin in the commercial banks of Nepal within the period under study. The regression coefficient reveals that there is insignificant positive relationship of net profit margin with liquidity ratio and investment ratio. However the net profit margin is significantly ($p=0.023<0.05$) negatively related with capital ratio. Based on these findings we fail to reject the null hypothesis 4 and 5 concluding that there is no statistically significant relationship of net profit margin with liquidity ratio and investment ratio but the 5th hypothesis is rejected and concluded that is statistically negative impact of capital ratio on the net profit margin of commercial banks in Nepal.

Conclusion

This paper examined the relationship of liquidity measures and profitability of commercial banks in Nepal. The empirical analysis was conducted using multiple regression models by taking return on assets as dependent variables to proxy the profitability while liquidity ratio, investment ratio and capital ratio were the independent variables as proxy of liquidity measures. More than 49 percent bank profitability measured by return on assets and net profit margin is predicted by the explanatory –liquidity variables. This empirical analysis reveals that there is insignificant positive relationship between liquidity ratio and return on assets. Similarly, there is insignificant negative relationship between investment ratio and capital ratio with return on assets. It is also found that there is insignificant positive relationship of net profit margin with liquidity ratio and investment ratio. However the net profit margin is

significantly negatively related with capital ratio. Based on the results it is concluded that the liquidity measure are not statistically significant in determining the profitability of commercial banks in Nepal expect the capital ratio. This study contributes to the literature by estimating a panel data model of profitability and liquidity management for the Nepalese banking sector that presents some useful information for the important role of liquidity in profitability, it leaves a room for future research to find out the major determinants of liquidity by considering both bank as well economy specific variables by including other development banks and finance companies.

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